



Bureau of Safety and Environmental Enforcement

Evaluation of Potential Technological Solutions to Safety Issues

Doug Morris

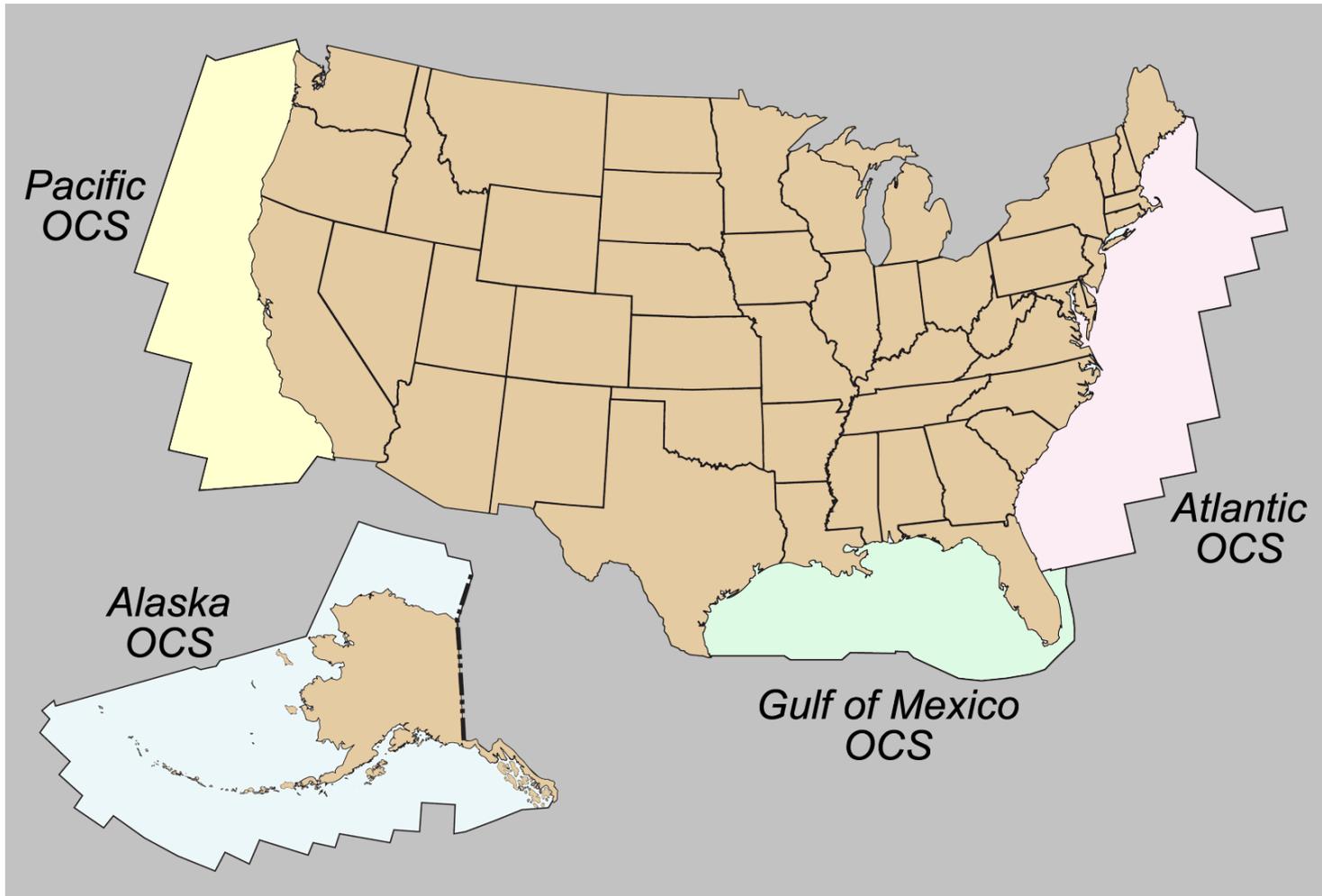
MGD and EKD Technology Solutions Public Forum

April 17, 2017

Houston, TX

“To promote safety, protect the environment and conserve resources offshore through vigorous regulatory oversight and enforcement.”

OCS Federal Jurisdiction



Offshore facilities that handle, store, or transport oil

Why best available and safest technology?

Outer Continental Shelf Lands Act (OCSLA)

“..on all new drilling and production operations and, wherever practicable, on existing operations, the use of the best available and safest technologies which the Secretary determines to be economically feasible, wherever failure of equipment would have a significant effect on safety, health, or the environment, except where the Secretary determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies.” (43 U.S.C. 1347(b))

Why the renewed focus on BAST?

- Deepwater Horizon investigations
- Ocean Energy Safety Advisory Committee
 - Identify and prioritize technologies
 - Include expertise from all sectors
 - Not endorse specific products but provide a basis for establishing appropriate performance standards
 - Focus on technologies, equipment, and/or processes that are most critical for safe operation
 - Evolve as new technologies develop

Objective?

- Find technological solutions to significant safety issues
- Open and transparent process
- Significant collaboration with subject matter experts and standards organizations
- Establish performance levels based on evaluation of available technology
- Consistent and verifiable data
- A solution that is justified from cost/benefit standpoint

Goal is NOT to:

- Develop prescriptive requirements
- Select a technology
- Result in an automatic phase-out of existing technology
- Prevent alternative solutions from being developed



BAST Process

Joseph Levine

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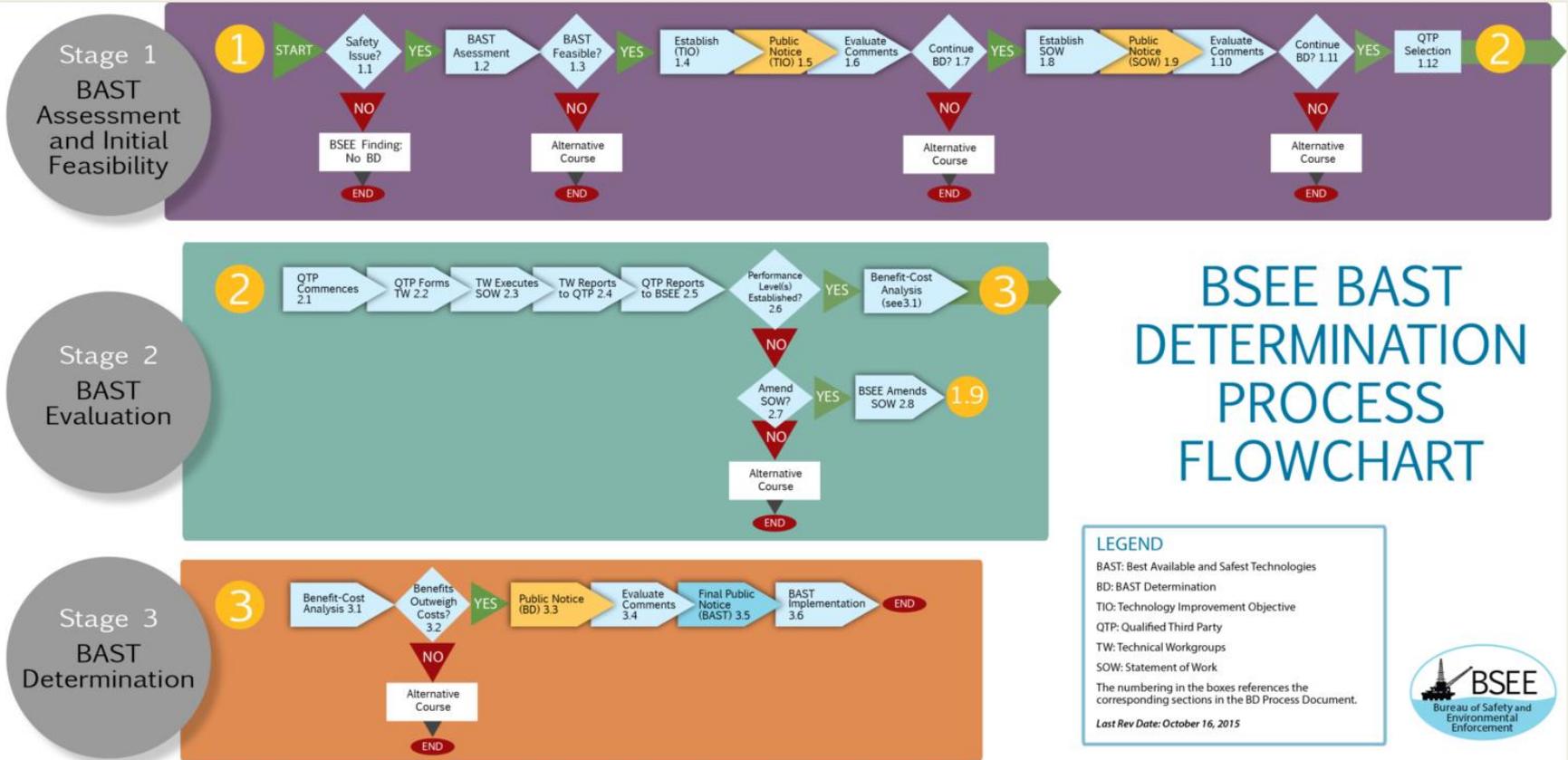
Safety Collaboration

- BSEE and Industry worked together in 2014-2015 to develop an alternative process to address critical safety issues
 - American Petroleum Institute
 - Offshore Operators Committee
- Process addresses these issues in a structured, collaborative manner

BSEE Outreach

- BSEE BAST Forum, 11/12/15, Houston, TX
- Offshore Operators Committee General Meeting, 12/2/15, New Orleans, LA
- National Ocean Industries Association Annual Meeting, 4/22/16, Washington DC
- Ocean Energy Safety Institute BAST Forum, 4/17/17

BAST Determination Process



BSEE BAST DETERMINATION PROCESS FLOWCHART

LEGEND

- BAST: Best Available and Safest Technologies
- BD: BAST Determination
- TIO: Technology Improvement Objective
- QTP: Qualified Third Party
- TW: Technical Workgroups
- SOW: Statement of Work

The numbering in the boxes references the corresponding sections in the BD Process Document.

Last Rev Date: October 16, 2015



BAST Determination Process (Summary)

Stage 1 - Assessment & Initial Feasibility

- BSEE
 - evaluates circumstances leading to a determination
 - drafts performance goal
 - prepares Statement of Work
 - issues Public Notices requesting comments
 - selects Qualified Third Party

Stage 2 - Evaluation

- Qualified Third Party
 - manages evaluation and forms Technical Workgroups
 - Technical Workgroup execute testing/analysis
 - BSEE reviews project findings

Stage 3 - Determination

- BSEE
 - conducts Benefit-Cost Analysis
 - issues Public Notice requesting comments
 - requires BAST

Takeaways

- Three stages
- Triggers – domestic/international safety issues
- Performance based
- Technology driven
- Transparent – 3 Public Notices requesting comments

Methane Gas Detection Safety Issue

- Helicopter incidents (2011/2013) resulted in ditching due to ingestion of vented gas during takeoff
- NTSB recommendations to BSEE
 - Develop system/procedure to mitigate the risk of ingesting vented gas by helicopters in vicinity of platforms
- BSEE TAP Study No. 733 - Aviation Safety
 - Task 5: Effects of Combustible Gas on Helicopter Operations recommended BSEE explore use of methane detection devices to provide early warning to pilots/facility
 - Study peer reviewed

Early Kick Detection Safety Issue

- BSEE Panel Report, Loss of Well Control, Walter Oil and Gas, 7/2013
 - Well completion, explosion/fire, \$10M+ in damages
 - Rig crew did not recognize early signs of problem which delayed them from implementing well control procedures
- Macondo, 4/2010
 - National Academy of Engineering, Chief Counsel's Report, National Commission Report all stated that early kick detection could have minimized/prevented failure
- BSEE TAP Study No. 765 - *Loss of Well Control Occurrences and Size Estimators*
 - Improved Kick Detection will give a corresponding reduction in LOWC event frequency



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Safety & Technology Assessment

Mick Else

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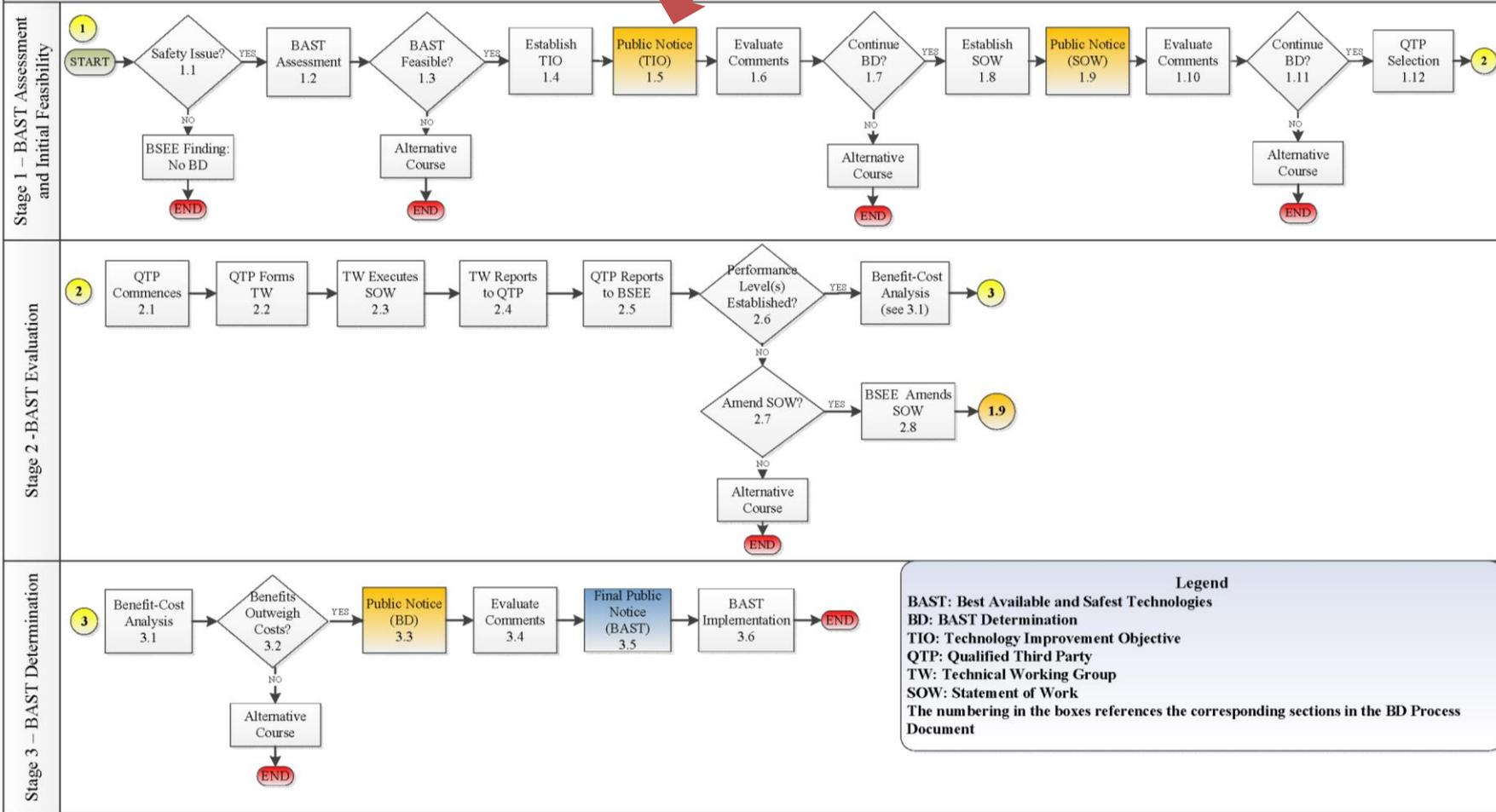
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BAST Determination Process Flowchart

Current Stage

Figure A: BSEE DRAFT BAST DETERMINATION PROCESS FLOWCHART

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Methane Gas Detection Technology Solutions

● Safety Issue:

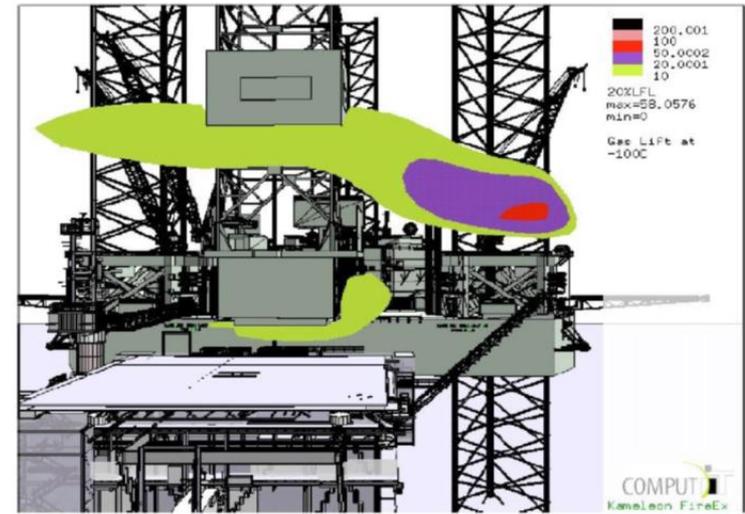
- Threats Posed by Vented Gas to Helicopter Operations

● Data Review:

- Incident Reports
- BSEE Funded Studies

● Assessment:

- Data Collection
- Evaluated Equipment
- Performed Feasibility Assessment
- Developed Findings



Methane Gas Detection Technology Solutions

Technology Improvement Objective

- Developed performance objective to identify potential BAST

Based on an evaluation of commercially available technology, what is the lowest level of methane (at or above the LFL) that can be detected in a cost effective and feasible manner in the vicinity of the helidecks?

Early Kick Detection Technology Solutions

○ Safety Issue:

- Kicks leading to LOWC events

○ Data Review:

- Incident Report
- BSEE Funded Studies
- BSEE Investigation Report

○ Assessment:

- Data Collection
- Evaluated Equipment
- Performed Feasibility Assessment
- Developed Findings



Early Kick Detection Technology Solutions

Establish Technology Improvement Objective

- Developed performance objective to identify potential BAST

Based on an evaluation of commercially available technology, what is the lowest volume of formation fluid influx (in bbls/mcf) that can be detected and the earliest detection (in seconds) of the influx measurable in a cost effective and feasible manner?

Future Activities for Technology Solutions

Next Steps

● **Evaluate Comments from Forum:**

- Review public comments; revise Objective
- Continue the Process as is or modify?
- Consider Alternative Course

● **Establish Statement of Work**

- Finalize Near Term Work-plan
- Identify Third Party and Industry Collaboration Partners

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Comments, Questions, Discussion



What We Do / Office of Offshore Regulatory Programs / Emerging Technologies / **Best Available and Safest Technologies**

- Administrative Services ▶
- Budget, Planning & Performance ▶
- Safety Enforcement ▶
- Environmental Focuses ▶
- Incident Investigations ▶
- International Engagement ▶
- Oil Spill Preparedness ▶
- Offshore Regulatory Programs ▼
 - Emerging Technologies
 - Best Available and Safest Technologies
 - Contract Support
 - Systems Reliability Section
 - Bolt and Connector Failures
 - Offshore Safety Improvement ▶
 - Regulations & Standards
 - Risk Assessment & Analysis
 - Houston Engineering Technology Center
- Research ▶

Best Available and Safest Technologies (BAST)

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Best Available and Safest Technologies (BAST)

The Bureau's Best Available and Safest Technologies (BAST) Program establishes a process for fulfilling the provisions of the [Outer Continental Shelf Lands Act \(OCSLA\)](#), Amendments of 1978 through [30 CFR 250.107\(c\)](#), which requires offshore operators to use BAST whenever practical on all exploration, development, and production operations when failure of equipment would have a significant effect or impact on safety, health, or the environment.



In accordance with the Act, BSEE may initiate a BAST Determination Process to evaluate safety, health or

environmental concerns.

The BAST Program objectives include:

- Developing a nationally recognized process for implementing BAST provisions of the OCSLA through a partnership with affected parties.
- Overseeing the BAST process when safety critical equipment issues have been identified that point towards regulatory gaps in the BSEE program.
- Using a performance based program rather than a prescriptive program to determine BAST technology solutions.
- Relying on consistent and verifiable testing and evaluation of a technologies operational history as a cornerstone to determining BAST performance levels.

WHAT IS BAST?

The BAST Program includes commercially available technologies that meet a specified safety performance level (s) as established by the BSEE Director.

BAST Determination Process